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| 10/529,199 | 06/22/2005 | Dieter Huhse | 3286-101 | 2124 |
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| ROTHWELL, FIGG, ERNST & MANBECK, P.C. 1425 K STREET, N.W. SUITE 800 WASHINGTON, DC 20005 | | | CARTER, MICHAEL W | |
| | | | ART UNIT | PAPER NUMBER |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

Office Action Summary

Application No.

10/529,199

Applicant(s)

HUHSE ET AL.

Examiner

Michael Carter

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 3/25/2005 9/2/2005
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. **Claims 1-2, 8, 11-12, 18, and 19** are rejected under 35 U.S.C. 102(b) as being anticipated by Koichi et al. JP Publication 58115947 (hereinafter referred to as Koichi).

3. **For claim 1**, Koichi teaches a method for generating an optical laser pulse (Po), in which a main laser ("2nd semiconductor laser", label 6) is driven with an electrical control signal (through 1, 2, and "2nd driving circuit" 7), and the optical laser pulse is generated by means of the main laser (label 6), an optical injection pulse (I) of an auxiliary laser ("1st semiconductor laser", label 4) being fed into the main laser, and the optical injection pulse (I) being generated in such a way that it arrives in the main laser at a point in time at which, on account of the control signal, the charge carrier density in the main laser has just reached or just exceeds the threshold charge carrier density ("the exciting signal of the laser 6 is synchronized with the injected optical signal") (Abstract).

4. **For claim 2**, Koichi teaches the optical injection pulse (I) is generated by application of an electrical auxiliary control signal (through 1, 2, and "1st drive circuit" 3), the auxiliary control signal being applied to the auxiliary laser ("1st semiconductor laser",

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label 4) temporally before the control signal is applied to the main laser, and the time difference between the application of the control signal to the main laser and the application of the auxiliary control signal to the auxiliary laser corresponding to the time period required by the optical injection pulse from the auxiliary laser to the main laser ("the exciting signal of the laser 6 is synchronized with the injected optical signal") (Abstract).

5. **For claims 8 and 18**, Koichi teaches the optical injection pulse and/or the optical laser pulse are generated by a semiconductor laser (Abstract, 1st and 2nd semiconductor laser).

6. **For claims 11 and 19**, Koichi teaches a device for generating an optical laser pulse having a main laser (label 6), which is driven with an electrical control signal, (through 1, 2, and "2nd driving circuit" 7) and generates the optical laser pulse, and an auxiliary laser (label 4), which is optically connected to the main laser and feeds an optical injection pulse into the main laser (label 5, "optical coupling circuit), an electrical auxiliary control signal (through 1, 2, and "1st drive circuit" 3) being applied to the auxiliary laser (label 4) in such a way that its optical injection pulse arrives in the main laser at a point in time at which the charge carrier density of the main laser has just reached or just exceeds the threshold charge carrier density ("the exciting signal of the laser 6 is synchronized with the injected optical signal") (abstract).

7. **For claim 12**, Koichi teaches the auxiliary control signal is present at the auxiliary laser before the control signal is present at the main laser, to be precise in a manner time-offset by a time difference corresponding to the time period required by the

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optical injection pulse from the auxiliary laser to the main laser because "the exciting signal of the laser 6 is synchronized with the injected optical signal" (Abstract).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 3-4, 6, 13-14, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi, in view of Mourou US Patent 4,347,437. (hereinafter referred to as Mourou).

10. **For claim 3**, Koichi remains applied as above.

Koichi does not teach the time-offset application of the electrical control and auxiliary control signals is effected by suitably selecting the electrical propagation times of the control signal and of the auxiliary control signal to the main and auxiliary lasers.

However, Mourou does teach consideration of electrical propagation times when determining time delays (column 12, line 67 - column 13, line 3).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to consider the electrical propagation time according to Mourou when synchronizing the optical signal and exciting signal according to Koichi.

11. **For claim 4**, Koichi teaches the electrical control signal and the auxiliary control signal are generated by the same signal generator ("an electrical signal input terminal",

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1), the signal generator being connected to the main laser via a first drive line (through 1, 2, and "2nd driving circuit" 7), and to the auxiliary laser via a second drive line (through 1, 2, and "1st driving circuit" 3) (Abstract).

12. **For claim 6**, the limitation "the length (L1) of the first drive line (20) is selected in such a way that the propagation time of the control signal (St) to the main laser (30) is of the same magnitude as the propagation time sum resulting from addition of the propagation time required by the auxiliary control signal (HSt) to the auxiliary laser (50) via the second drive line (40) and the propagation time required by the optical injection pulse (I) from the auxiliary laser (50) to the main laser (30)" restates the requirement taught by Koichi that "the exciting signal of the laser is synchronized with the injected optical signal" (Abstract).

13. **For claim 13**, Koichi does not teach the time-offset application of the electrical control and auxiliary control signals is effected by suitably selecting the electrical propagation times of the control signal and of the auxiliary control signal to the main and auxiliary lasers.

However, Mourou does teach consideration of electrical propagation times when determining time delays (column 12, line 67 - column 13, line 3).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to consider the electrical propagation time according to Mourou when synchronizing the optical signal and exciting signal according to Koichi.

14. **For claim 14**, Koichi teaches the main laser (label 6) and the auxiliary laser (label 5) are connected to the same signal generator ("an electrical signal input

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terminal", 1) via a first drive line (through 1, 2, and "2nd driving circuit" 7) and via a second drive line (through 1, 2, and "1st driving circuit" 3), respectively, said signal generator generating the electrical control signal for the main laser and the auxiliary control signal for the auxiliary laser.

15. **For claim 16**, the limitation "the length of the first drive line (20) is selected in such a way that the propagation time of the control signal (St) to the main laser (30) is of precisely the same magnitude as the propagation time sum resulting from addition of the propagation time required by the auxiliary control signal (HSt) to the auxiliary laser (50) via the second drive line (40) and the propagation time required by the optical injection pulse (I) from the auxiliary laser (50) to the main laser (30)" restates the requirement taught by Koichi that "the exciting signal of the laser is synchronized with the injected optical signal" (Abstract).

16. **Claims 5 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi, in view Mourou, and further in view of Basting et al. US Patent 6,005,880 (hereinafter referred to as Basting).

17. **For claims 5 and 15**, the previous combination remains applied as to claim 3 above.

The previous combination does not teach the control signal and the auxiliary control signal are generated by two synchronized signal generators, one signal generator being connected to the main laser via a first drive line and the further signal generator being connected to the auxiliary laser via a second drive line.

However, Basting teaches using two separate signal generators ("excitation circuits", column 1, lines 27-28) for driving two separate lasers (column 1, lines 23-25) in order to be able to adjust relative timing using synchronized triggers.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the two generators in Basting with the device of the previous combination in order to be able to adjust the relative timing of pulses.

18. **Claims 7 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi, in view of Braiman et al. US PG Pub 2003/0103534 (hereinafter referred to as Braiman).

19. **For claims 7 and 17**, Koichi remains applied as above.

Koichi does not teach the optical injection pulse of the auxiliary laser is fed into the main laser via an optical splitter, and the optical laser pulse of the main laser is coupled out via said optical splitter.

However, Braiman teaches using a splitter to couple light into a laser as well as coupling light out (figure 1, label 30).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the beam splitter in Braiman with the device in Koichi in order to provide a coupling means for the auxiliary laser.

20. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi, in view of Dupont et al. US Patent 5,555,121 (hereinafter referred to as Dupont).

21. **For claim 9**, Koichi remains applied as above.

Koichi does not teach the optical injection pulse is generated by a laser that emits essentially in monomode fashion, preferably a DFB laser or a DBR laser, and the optical laser pulse is generated by a multimode laser, preferably a Fabry-Perot laser.

However, Dupont does teach does not teach the optical injection is generated by a laser that emits essentially in monomode fashion (figure 1, label LD1), preferably a DFB laser or a DBR laser, and the optical laser pulse is generated by a multimode laser (figure 1a, label LD2 and column 3, lines 32-35), preferably a Fabry-Perot laser in order to make laser the second laser emit on a single wavelength.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a monomode laser injected into a multimode laser in combination with Koichi's device in order to obtain pulses a single wavelength.

22. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Koichi, in view of Hakimi et al. US PG Pub 2002/0015206 (hereinafter referred to as Hakimi).

23. **For claim 10**, Koichi does not teach a multiplicity of optical laser pulses are generated in the manner described.

However, Hakimi does teach a multiplicity of optical laser pulses are generated in for use in optical communications (paragraph 5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Koichi's device to create a multiplicity of pulses for use in optical communications.

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Conclusion

24. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Carter whose telephone number is (571) 270-1872. The examiner can normally be reached on Monday-Friday, 7:00 a.m.-4:30 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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